

### **Remarks**

The Office Action dated February 25, 2005 has been received and duly noted. The Examiner has indicated that Claims 35-40 are allowed.

Independent Claim 1 and various dependent claims were rejected as being unpatentable over Stephenson (4,635,967) in view of Applicant's admitted prior art. Applicant submits that the combination set forth in these claims is not taught or suggested by either Stephenson, the art admitted by Applicant, or any reasonable combination thereof.

The Examiner contends that the sealing ring of Stephenson comprises of a steel body 32, with this steel body having first and second frusto-conical sealing surfaces 42. The sealing ring of Stephenson is expressly stated as being fabricated from a corrosion-resistant alloy, such as a stainless steel body, not a carbon steel body as recited in Claim 1. Claim 1 also recites first and second conical sealing surfaces on the carbon steel body for sealing with the first and second conical inner sealing surfaces, and accordingly the corresponding structure in Stephenson are to radially outer sealing surfaces 42a as shown in Figure 2. The Examiner recognizes that Stephenson does not specifically state that its body is made from carbon steel or low alloy steel, but contends that Applicant has admitted that bodies from such steel have been utilized. Given the choice between utilizing a carbon steel body and a more expensive stainless steel body, Stephenson thus discloses the use of a stainless steel body. Nothing in the cited references discloses or suggest,

however, utilizing a carbon steel body in combination with an inlay secured to the carbon steel body by welding, with the inlay comprising one of a stainless steel or a corrosion resistant alloy, such that the expansion coefficient of the carbon steel body is less than  $6.5E-6$  inch per inch. The Examiner also contends that the '967 Patent discloses first and second corrosion-resistant alloy inlays. The reference does not disclose the location of these inlays, namely to define one of the outer sealing surfaces on the carbon steel body as recited in Claim 1. The disclosure of a carbon steel body, on the one hand, and a stainless steel body with an inlay, on the other hand, does not suggest the sealing ring recited in Claim 1. Nothing in the '967 Patent suggests any benefit to combining the expansion coefficient of a carbon steel body with the sealing properties of a welded inlay comprising stainless steel or a corrosion resistant alloy.

With respect to dependent Claims 4-6 and 20-22, the Examiner recognizes that Stephenson does not disclose the inlay thicknesses or inlay volumes as recited in these claims, but contends that this is merely a design choice discovered by routine experimentation. There is no support for the Examiner's position. The limitations set forth in these dependent claims are significant improvements. The Examiner has not set forth any design criteria which would suggest that the stated ranges are either a matter of design choice or were discovered by routine experimentation. This case is clearly distinguishable from *In re Aller*, which concerned an optimum value of a variable in a known process. The recitations in the present claims are not a result-effective variable. The disclosed ranges

produce unexpected results in terms of corrosion resistance and material expansion coefficients, and do not overlap similar variables in the prior art. Criticality is not required for the limitations to be non-obvious.

With regard to dependent Claim 7, 8, 13, 14, 23, and 24, the Examiner recognizes that Stephenson does not disclose a coating over the inlays. Tillman, however, does not disclose inlays, and thus does not disclose coating the surfaces over the inlays. Claim 1 specifies that the inlay is secured to the carbon steel body by welding, and comprises one of a stainless steel and a corrosion resistant alloy. Tillman fails to teach such an inlay. Seals 31 and 32 provided in Tillman are conventional seals provided in grooves, and are not inlays. Accordingly, Applicant submits there is no suggestion in the references for the combination set forth in Claim 1, and no suggestion or the further combination set forth in these dependent claims.

In paragraph 10, the Examiner contends that Applicant has merely recognized another advantage which would naturally flow from following the suggestions of the prior art. There is no suggestion in the prior art, however, to the combination of a carbon steel body as set forth in Claim 1 with the corrosion-resistant inlays defining the outer sealing surfaces on the carbon steel body as recited in Claim 1. The differences between the prior art sealing rings and the present sealing rings are significant and are non-obvious. There is no suggestion in the prior art for making the combination set forth in the pending claims. The Examiner further contends that Applicant admits that carbon steel is a


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corrosion resistant alloy, although Applicant does not believe he has indicated that low carbon steels have appreciable corrosion resistance. As indicated at page 1 commencing the second paragraph of the "Background of the Invention," Applicant has distinguished low carbon steels which lack corrosion resistance from stainless steel and corrosion resistant alloys.

Method Claim 17 has been corrected in the preamble. Claim 17 is considered distinguishable from the prior art for reasons discussed above.

In view of the above, early allowance of the Application is requested.

Respectfully submitted,

  
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By: 

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